Pleasure, pain, and prophylaxis: olfaction (the neglected sense)

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Ladies and gentlemen, you stink! Each of you has a unique, genetically determined odor. Your aroma is so unique that a trained dog can trace your path, undistracted by the myriad of smells with which your spoor has been mixed. The structure of chemosensory communication is wonderfully ancient: coelenterates, nematodes, arthropods, and mammals, including humans, identify themselves and their biologic status by chemistry—the release of specific chemicals into the local environs (1). All living creatures from the simplest algae or amoeba to highly sophisticated human beings identify themselves by chemicals which are recognized by specialized cells that constitute the olfactory system. Each human being has a unique identifying odor linked to his or her histocompatibility genotype. One of my mentors in medicine, Lewis Thomas, suggested 20 years ago that a bloodhound's nose would be a more accurate method of selecting donors and recipients for organ transplantation than all of the laboratory testing. But no one has taken his suggestion seriously.

Table 1. The neurology and pathophysiology of the nose

Function	Cranial nerve	Effect
Somatic sensation: "common chemical sense"	V	Irritation Neurogenic inflammation
Olfaction	I: olfactory pathway	Odor sense: smell Memory
Chemoidentity and chemorecognition	Vomeronasal organ: I Accessory olfactory pathway	Recognition and signaling: regulation of physiologic function and mood Memory

Table 2. Inflammatory pathways

	Olfactory and neurogenic	Immunogenic
Ligands	Volatile organic chemicals	Protein aeroallergens
Receptors	Chemical receptors on sensory nerve C-fibers	Immunoglobulin E on mast cells
Mediators	Substance P and other neuropeptides	Histamine, leukotrienes, and other factors
Results	Mast cell degranulation Other C-fiber sensory nerve stimulation	C-fiber sensory nerve stimulation Distant mast cell degranulation

THE OLFACTORY MECHANISM

The olfactory mechanism is exquisitely sensitive; only a few molecules of an odorant are needed to produce recognition and awareness of odor (2). With recognition comes memory and associations, setting in motion a variety of learned responses. We know the world around us by olfactory information, and we divide our world of odors into the foul and the fragrant (3). The olfactory history of humankind reveals culturally determined nosologies of smells: what is considered desirable and fragrant in one place or era can be considered foul and fetid in another place or era (3, 4). Your nose contains 3 signaling systems, each mediated by a separate set of cells and chemicals.

Recent studies have distinguished the olfactory sensation, which is mediated by the first cranial nerve, from pain and touch sense, which is mediated by the fifth cranial nerve *(Table 1)* (5, 6). Airborne chemicals interact with both first and fifth cranial nerve receptors; with cranial nerve I the result is aroma, with cranial nerve V the result can be irritation and discomfort in subjects predisposed in unknown ways. The irritant reflex from somatic sensory nerves results in neurogenic inflammation, which can mimic the inflammatory response of atopic allergy *(Table 2)* (6, 7). The sensual nature of the nose is enhanced by the discovery of a human vomeronasal organ, which is the organ for specific chemosensory recognition and signaling (8). The vomeronasal receptors bind chemical molecules of differing sizes and signals, some of which are not volatile and must be presented in liquid form. Vomeronasal receptor cells have neuronal connections inside and outside of the olfactory system, so that some recognition chemicals can produce physiologic and psychologic effects without odor (9, 10). Human pheromones, our chemical

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identity and signaling molecules, are the essential stimuli of the vomeronasal system. Some but not all pheromones are odorant molecules, stimulating olfactory receptors as well, and some odorant molecules have structural similarity to pheromones (11).

PHEROMONES

Many creatures select their reproductive mates by smell, using chemical identification and recognition to identify appropriate breeding partners. Insect pheromones are potent odorants and attractants: minuscule numbers of pheromone molecules will call males from surprising distances. Inbred mice will breed preferentially with hybrid mice or other breeds if given the choice; in fact, a female mouse fertilized by her own breed will spontaneously abort when exposed to the odor of a hybrid male. Scent and sex are a biologically ancient connection, and *Homo sapiens* is no exception. Human pheromones have been identified and control reproduction in subtle ways. For example, women exude a pheromone that regulates menstruation and ovulation so that women living in close contact, as in college dormitories, will tend to cycle synchronously after several months.

The chemical structures of perfumes and resin-based incense and mammalian pheromones—the chemical signals of identity and sexual attraction—are similar, and the two are reported to smell alike. The link between perfumes and seduction is as old as the use of burnt offerings and incense. Indigenous cultures used fumigation with incense and applications of fragrant oils to prepare women for their bridal night (3, 4, 12, 13). Circe sets the tableau for the seduction of Ulysses using aromatic philters. Solomon was courted by the Queen of Sheba, who brought the fragrant gums and spices of Araby as gifts. Judith, in the Old Testament story, anointed her body with redolent unguents in order to seduce, and ultimately slay, Holophernes. The Song of Solomon attests to the sensual importance of odor:

> While the king sitteth at his table,
> my spikenard sendeth forth the fragrance thereof.
> A bundle of myrrh is my well beloved unto me:
> he shall lie all night between my breasts.
> My beloved is unto me as a cluster of henna flowers
> in the vineyards of Engedi (Song of Solomon 1:12–14).

Rousseau, that romantic rationalist of the 18th-century Enlightenment, wrote:

> The sense of smell is the sense of imagination; giving a stronger tone to the nerves, it greatly disturbs the brain; which explains why it can arouse the amorous temperament momentarily, but eventually exhausts it. Its effects in love-making are well known; the sweet perfume of a dressing-room is not so flimsy a trap as we might think; and I do not know whether to congratulate or to pity the prudent and unfeeling man who has never thrilled to the scent of flowers on his mistress's bosom.

The robust sales of contemporary perfumes for women and for men attest to the continuing potency of scent in human sexual behavior.

ODORS: A HISTORICAL PERSPECTIVE

In medicine, Hippocratic tradition emphasized the importance of airs and waters and climate. There were healthful "airs." There were pathogenic "airs." Miasmas, the exhalations of swamps and fetid waters, carried disease. Pestilence and epidemic fevers were said to be caused by lethal emanations. Ancient tradition held that foul odors, indicators of decay and poison, could be lethal (4). Stench signaled danger and the presence of disease. It made eminent sense to combat dangerous mephitic air and fetor with healthful fragrance from burning aromatic herbs.

During the Black Plague that decimated Europe in 1348, the medical faculty in Paris stated:

> The "deadly corruption of the air" was due essentially to an ill-omened conjunction of the stars when vast amounts of disease-bearing and poisoned vapors arose out of the earth and the waters and infected the very substance of air. Through the act of respiration this corrupt atmosphere penetrated into and tainted organisms that were already predisposed to putridness by overeating, intemperance, and excess of passions—factors already mentioned in antiquity—as well as from hot baths, which relaxed and moistened the body (4).

Through this pronouncement a direct relationship was drawn in the public's mind between the putrefaction of the body and the putrefaction of the atmosphere. In France, from the 13th century on, the term *peste* or *pestilence* was used for both the disease and the revolting stench associated with it. The connection between odor and health dominated medical thinking during the 16th and 17th centuries. The persistent Hippocratic notion of "airs and waters" helps to explain the value placed upon aromatic herbs, incense, fumigation, and perfumes: for diseases associated with the air and the things borne by air—odor, putrefaction, and pestilence—airborne remedies could best provide protection or relief.

Inhaling aromatic smoke, or smoking, can alter state of mind by inducing the awareness of the sacred and by the specific pharmacologic effects of the material smoked. Inhaling the smoke from burning aromatic herbs to produce altered awareness is possibly as old as the capacity to control fire (12, 14). Tubes of stone, wood, reed, and pottery, used to inhale the smoke of hemp and coltsfoot *(Tussilago farfara)*, have an ancient history in Europe, Asia, and Africa. The Greco-Roman Materia Medica, relying upon the authority of Hippocrates, Dioscorides, Pliny, and Galen, prescribed the inhalation of smoke for the treatment of asthma and cough (15). In the Middle Ages physicians recommended the smoking of herbs for "windy griefs of the breast" (14). Fumigation and inhalation using aromatic herbs and oils continue in present-day use.

Sir Francis Bacon described the artifices, preventives, and medicaments to counteract noxious vapors and to preserve health and potency:

> They have in physick, use of pomanders, and knots of powders, for drying of rheums, comforting of the heart, provoking of sleep, etc. For though those things be not so strong as perfumes, yet you may have them continually at your hand; whereas perfumes you can take but at times; and besides, there be divers things that breath better of themselves, than when they come to the fire; as nigella romana, the seed of melanthium, amomum, etc.
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> Smells of musk, and amber, and civit, are thought to further venerous appetite . . . (16).

During the 18th century, odor became a serious fashion and health concern. The foul and the fragrant became class markers (3). The philosophies of the Enlightenment emphasized the importance of the senses as a source of knowledge. Fragrant odors,

socially approved aromas, were pleasing and helpful, a stimulant to the imagination.

The importance of olfaction as a component of "enlightenment" magnified the significance of smells. The naturalist Buffon wrote:

> A universal organ of feeling, [the nose] is an eye that can see objects, not only where they are, but even where they have been; it is a taste organ by which the animal can savor not only what he can touch and seize upon, but even that which is far away and unattainable; it is the sense by which he is first, most frequently and most certainly given warning, by which he acts, by which he decides and by which he recognizes what is either suited or contrary to his nature, the sense, finally, by which he perceives, feels and chooses what can satisfy his appetite (17).

Smells were harbingers of danger and distaste. Physicians warned about the stench of pestilence. Social arbiters warned about the unwashed, fetid classes. Sweet-smelling perfumes for the body and the home grew increasingly important, for they labeled the individual as both healthy and high-class. By the late 18th century, cities had grown and were filled with the products of household and industrial combustion and garbage. Cities smelt bad. Medical and municipal authorities had some recommendations:

> Flee the stultifying air of the cities, fill your brains with a healthy dose of country air; stop living like automatons; let the universe know you have a soul, however infrequently it be uplifted. If you constantly breathe in the city's air your throat should be swept just as you sweep your chimneys. The fish that lives in muddy waters takes on a slimy taste; the same holds true for men who breathe in only coal smoke and the emanations of the incense offered up to the Goddess Cloacina, whose many alters are constantly areek with it. The brains and lungs of such persons must be impregnated with those vapors . . . (4).

The 19th century brought the engines and effluvia of industry and the Dickensian urban ghetto. City smoke and stench became the targets of a growing public health movement and sanitary reform.

Aromaphobia has become particularly common and intense during the last half of the 20th century. Never before have so-called bad odors been so systematically pursued. Breath odor, body odor, bathroom odors, and all sorts of natural smells are attacked and suppressed by socially acceptable fragrances, soaps, and disinfectants. There is remarkable antagonism to odors at the millennial transition. There is no longer talk of the stench of pestilence or the fetor of the poor; rather, we talk about the reek of the toxic waste dump, the pungent fumes of motor vehicle exhaust, and the dangers of tobacco smoke. Contemporary environmental puritanism urges us to believe the syllogism:

Chemicals smell.

Cancer is caused by chemicals.

Therefore, odors cause cancer.

My guess is that the inextricable connections between combustion, chemosensation, and intimate human behavior are close to the heart of antismoking sentiment and contemporary chemophobia. The safest environment has no smell.

The ill repute of smell is illustrated by the decline of olfaction in clinical medicine. Once upon a time the smell of pestilence was diagnostic and the physician's olfactory sensitivity an important stimulus to prescriptions for individual and public health. Nowadays, physicians do not talk about their nose, except in regard to their wine collections. Olfactory diagnosis is a lost art. However, aromatherapy has become a popular form of alternative medicine, and marketing scents remains a lucrative part of the cosmetic and personal hygiene industry. Aromatic cinema remains an active pipe dream.

SMOKE AND SCENT

It is prudent to remember that burning things to make smoke and scent has a history and symbolism that elevates the act of making smoke beyond the ordinary or commonplace (4, 12, 13, 18). Making smoke and scent is a public, visible act: propitiation, prayer, purification. Aromatic herbs and their use as fumigant and medicament were readily incorporated into religious and historical mythology (3, 4, 12). The gods may be invisible, but one can tell the presence of spiritual awareness and prayer by smoke and by smell. Aromatic smoke has been used to signal purification and consecration of places and people: communion with deity, sacrifice, and salvation. The magical, sacred nature of smoke and scent has been respected for time out of mind. Jehovah's instructions to Moses in the Book of Exodus are filled with fire, burnt offerings, and incense.

> And thou shalt receive them from their hands, and burn them upon the altar for a burnt offering, for a sweet savor before the Lord; it is an offering made by fire unto the Lord (Exodus 29:25).

> And thou shalt make an alter to burn incense upon: of acacia wood shalt thou make it (Exodus 30:1).

Burning incense in Buddhist, Hindu, and Taoist traditions symbolizes the presence of deity and the dispersal of prayers. In Christian ritual, smoke from censers traditionally symbolized prayers ascending to heaven. Burning aromatic plants, or smoke and scent making, because of the power symbolized, has been the property of gods and spirits and has been carefully regulated and used. The campfire and the incensed altar, the products of controlled combustion, draw humankind together and communicate with the unseen spirits of deity, ancestors, and nature.

The history of tobacco illustrates the changing fortunes of olfaction. Charles Singer began his short history of the introduction of tobacco into Europe thus:

> Tobacco first found its way into Europe rather as a medicament than as the solace and companion of fallen male nature (19).

His sentence crystallizes the history of tobacco, emphasizing tobacco's association with sin and masculine behavior. The dried leaves of 2 species of *Nicotiana, N. tabacum* and *N. rustica,* were widely used in the Americas before the arrival of Columbus (14, 18, 20, 21). Like coltsfoot *(T. farfara)* and hemp, *Nicotiana* contains psychoactive chemicals and, by empiric experience, was early on used for medicinal and self-indulgent purposes.

In the New World, Columbus and his men were quickly introduced to the indigenous practice of "drinking smoke." Shortly after his first landfall, Columbus sent 2 men to reconnoiter. The description of their findings in his journal has only this sentence about tobacco:

> By the way they met many people who always carried a lighted fire brand to light fire, and perfume themselves with certain herbs they carried along with them (11, 14).

Bartolomeo de Las Casas, the early chronicler of the European intrusion upon the New World, a missionary, and the keeper of portions of Columbus' journal, expanded upon this description in 1527.

> These two Christians found on the way . . . many people, the men with a half burned wood in their hands and certain herbs in order to take their smokes, which are some dry herbs put in a certain leaf, also dry, in the manner of a musket made of paper, like those the boys make on the day of the Passover of the Holy Ghost, and having lighted one part of it, by the other they suck, absorb or receive that smoke inside with the breath, by which they become benumbed and almost drunk, and so it is said that they do not feel fatigue. These muskets, as we will call them, they call tobacco . . . (22).

The arrival of tobacco in Europe, the Middle East, and Asia was rapidly followed by the production of instruments for its use: water pipes, clay pipes, and carved wooden pipes were adapted from the prototypes used for smoking hemp and other herbs (14). The growth of the tobacco-implement industry demonstrates the popularity of the habit-forming weed and the desire to smoke often and well. As European exploration expanded, other methods for consuming tobacco were found. Chewing and snuffing were common, but the most obvious tobacco instrument was the pipe. Jacques Cartier, during his second voyage to North America in 1535 to 1536, described the use of tube pipes.

> There groweth also a certain kind of Herb, whereof in Summer they make great provision for all the year, and only men use it, and first they cause it to be dried in the Sun, then wear it about their neck wrapped in a little bag, with a hollow piece of stone or wood like a pipe, then when they please they make powder of it, and then put it into one of the ends of the said cornet or pipe, and laying a coal of fire upon it, at the other end suck so long, that they fill their bodies full of smoke, till it comes out of their mouth and nostrils. They say that this does keep them warm and in health; they never go without some of it about them (14).

Native American pipes date to more than 3000 years ago, and evidence of nicotine residues from such relics can be dated to about 1500 years ago (23). All of the Amerindian tribes smoked tobacco, but only some grew it (20, 24, 25). Among the Plains Indians of the upper Missouri River region, the Blackfoot, Crow, Hidatsa, Mandan, and Arikara cultivated tobacco (26). Other tribes such as the Arapaho, Gros Ventre, Assiniboine, Cree, and Comanche traded for their tobacco with other tribes. Among the Plains Indian tribes, tobacco use was restricted, reserved for communal ceremonies and solemn occasions. Pipes were the devices used; the "muskets" or cigars described by the Columbus expedition were not used. Usually only adult men were allowed to smoke, although Blackfoot and Cree women used small pipes. Young people were warned that smoking would make them poor runners. Some of the Plains Indian groups allowed tobacco smoking only by individuals with special qualifications: older women herbalists and designated senior men (24–27). Pipes were assembled, filled with tobacco, ignited, and passed according to distinct tribal rules. Smoking was a religious, ceremonial event among North American Indians to be given proper respect (26). Shoshone and Blackfoot elders would not smoke with moccasins on. A Blackfoot host passed the pipe to his left. Each recipient would take several puffs and pass the pipe to his left. When the end of the line was reached, the pipe would be returned to the host, and the sequence restarted.

Pipes and their use were highly charged symbols. Only certain people could make a pipe and endow it with power. Only selected people could assemble and smoke these pipes. "The rose-colored stone known as catlinite or pipestone comes from a quarry in Minnesota and was looked upon as symbolic of living flesh and blood and so sacred. All pipes made of this stone were fit for offering smoke to the gods and for cementing friendships" (26).

Tobacco burst upon Europe at the turn of the 16th century as a miraculous plant sharing with cinchona bark (quinine) a glorious reputation as a medicinal panacea. By 1560 tobacco was being grown in European physic gardens. English colonists from the failed Virginia settlement began commercial cultivation of tobacco in 1586. Sir Walter Raleigh, the proponent of English colonial enterprise, grew his own tobacco on his Irish estate.

During the first quarter of the 17th century, tobacco had become a sought-after commodity. Therapeutic and prophylactic claims contributed to the popularity and the demand for tobacco in Europe. In his 1646 book, *De Peste Libri Quator,* prominent Dutch physician Isbrand van Diemerbroeck asserted that tobacco smoke prevented the plague. Tobacco smoke insufflated into the rectum, the stomach, and the lungs was recommended as part of the resuscitation of the victims of drowning and asphyxiation (28). Sir Francis Bacon (1561–1626) wrote in his book of natural history, *Sylva Sylvarum*:

> Tobacco is a thing of great price, if it be in request. For an acre of it will be worth, (as is affirmed,) two hundred pounds, by the year, towards charge. The charge of making the ground, and otherwise, is great, but nothing to the profit (16).

By the 17th century tobacco in all its various forms had been widely used throughout Europe and Asia. Fomented by claims of medicinal magic and fostered by the addictive properties of its constituents, tobacco became the object of fashion and commercial exploitation. Nonmedicinal, self-indulgent, pleasure-seeking tobacco use flourished. Bacon recognized the addictive properties of smoking tobacco:

> Tobacco comforteth the spirits and dischargeth weariness; which it worketh, partly by opening, but chiefly by the opiate vertue, which condenseth the spirits (16).

The provision of tobacco as a privilege and pacifier for soldiers and sailors and noncombatant victims during the 30 Years War (1618–1648) was an early demonstration of the relationship between war and tobacco consumption that has continued to the present (11).

Common sense and experience had shown that the prophylactic and therapeutic claims for tobacco were spurious, inaccurate at best. Antitobacco sentiment, submerged during the excitement of 16th century exploration and experimentation with the bounty of the New World, erupted with criticism and taxation. During the 17th century tobacco smoke was transformed from "good air" into "bad air." The transformation began with early criticisms of its toxicity and irritant properties. King James I of England wrote his famous "counterblast to to-

bacco" in 1604 in which he pointed out the fallacies in the claims for tobacco as a panacea and observed that tobacco smoke stank!

> A custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black stinking fume thereof, nearest resembling the horrible stygian smoke of the pit that is bottomless (14).

A 1637 pamphlet supported the use of tobacco preparations as medicine but was titled "A brief and accurate treatise concerning the taking of the fume of tobacco, which very many, in these days do too too licentiously use" (11).

Antagonism to tobacco and tobacco smoking was an integral component of the sanitary reform agenda of the 19th century. The rumor that smoking tobacco caused impotence and sterility circulated (11). In the USA the Anti-Tobacco League warned that smoking tobacco caused sterility and was practiced only by "fallen women." "Lady nicotine" is not a lady, but "a little white devil" made from "the demon plant" wrote the Reverend George Trask, founder of the Anti-Tobacco League in Massachusetts, which succeeded in having public smoking banned in Boston in the 1850s (11). By mid century tobacco was relegated to the profane and ugly. Radical authors and artists smoked cigarettes. Prostitutes and laborers smoked cigarettes. Bizet's most famous heroine was a cigarette girl, and her public smoking in operatic performance was shockingly titillating.

Antitobacco policies suffered with the arrival of the cigarette machine. Hand-operated in the 1850s, American invention mechanized and industrialized cigarette manufacture in the 1880s (14). Cigarettes became a popular rage and an enormous profit-making industry. Cigarettes were the soldiers' friend during the terrible wars of the 20th century. Military strategy and government policy ensured widespread availability of cigarettes to the troops and even to the hospitals where the wounded and disabled were rehabilitated. Richard Klein describes the symbolism and the importance of tobacco smoking for the military in his book, *Cigarettes Are Sublime:*

> The munificent cloud of smoke draws a ring around the battle-hardened comrades and circles them in its embrace, drawing them closer together. What would a soldier be without tobacco? He would be totally alone with his melancholy and mourning. The smoke of cigarettes holds the ghosts at bay—or rather, Indian-like, brings the departed spirits into the diminished circle of the living, joins the past to the present, and creates the beneficent illusion of an eternal present with no loss. A fleeting antidote to depression, cigarettes are the greatest treasure to the bereft.
>
> But cigarettes also stimulate and sharpen the mind, promoting action. In war novels, they are frequently lit by officers at the moment they have to fix a plan or give an order. It is almost a requirement of command that decisions be taken only after a moment of self-concentration, the sign of reflective detachment and considered restraint before committing men's lives (11).

Amerindians considered tobacco a god. It has taken a century to return tobacco use to a publicly condemned habit. At the end of the 20th century, legislators passed laws banning public cigarette smoking on grounds where centuries before Indians gathered to meet and to smoke tobacco because smoking was essential to the ritual that unified the individual with the tribe and with its guardian myths and gods. In the last quarter of the 20th century, tobacco was made into an evil, unhealthful weed. Making smoke became increasingly regulated and in many public places prohibited. What we have in 2000—namely, very strict tobacco taboo—is not very much different from the social use of tobacco that existed before the commercialization and mass production of cigarettes.

Nowadays, instead of sterility and sin, tobacco is linked to cancer, chronic lung disease, cardiovascular disease, and to the novel ailment called multiple chemical sensitivity (MCS), or 20th-century syndrome. Abhorrence of even the faintest whiff of tobacco, smoke, and other odors epitomizes the contemporary opposition to smoking tobacco. In some recent studies >90% of patients claiming MCS were intolerant of tobacco smoke (29). In fact, MCS patients asserted that virtually all odors precipitated symptoms. They are people who would obliterate all forms of making smoke and scent. Even a nonaddicting, nicotine-free smoking device would be anathema. The anxiety of the aromaphobe is magnified by smell—any odor. The victims of aromaphobia are sent into paroxysms of suffering from all odors—from fine perfumes to sewer stench. The paroxysms are as much terror and the biologic consequences of acute stress as they are the biology of allergy or inflammation.

Because odor is such a potent biologic signal, precipitating behavior that ranges from flight and fright to flights of erotic fantasy and romantic fervor, it is difficult to separate the odorant from the injurious, intoxicant properties of the source. Are the symptoms claimed the result of neuropsychiatric reflexes triggered by odor or the direct molecular effect of the aromatic chemical? Rousseau observed that the olfactory sense is the "sense of imagination." Only a few molecules or whiffs of an odorant can set in motion fantasies and fears that precipitate reflex physiologic and psychologic events. Passion and panic are products of smell.

The idiosyncratic smell of tobacco and tobacco smoke readily identifies tobacco users and sites of tobacco use. It is impossible to disguise tobacco. It seems to me that restricting the smoking of pipes and cigars to specially reserved places for specially designated users is symbolically and culturally desirable, not an imposition or restriction of freedom. Pipes and cigars have not yet been the focus of vociferous antitobacco persecution, perhaps because their use retains formalities and decorum that are absent from cigarette smoking (30, 31). In fact, perhaps because of contemporary aromaphobia, cigars and cigar smoking have become chic, a privilege of the sophisticated connoisseur and the well-off. Magazines and boutiques market the refinements of taste and the technology of pipes and cigars. But, access is only to a special few: affluent individuals invited and initiated into the arcane knowledge of tobacco and tobacco use.

As long as these aroma-producing activities and products remain confined in special domains, controlled by adepts and not released upon an unsuspecting, susceptible public, I suspect that they will escape the wrath and reform of anxious, aromaphobic antitobacco activists. Nevertheless, it is important to recognize the potency of olfactory stimuli. There is always the danger that an inadvertent whiff of aromatic tobacco smoke will trigger a disproportionately large negative reaction. Makers of smoke must be vigilant and wary. Maintenance of proper discipline and ritual diminishes the societal and biologic risks and reaffirms the symbolic importance of making smoke. Cigarette smoking is such a

visible, odoriferous practice, it is not surprising that it has become the most intensively reviled form of controlled aromatic combustion.

The power of fire and smoke as symbols, stimulants, and irritants made the use of incense, fireworks, and other combustible substances the focus of ritual and strict social sanctions. If smoke contains power, only select people—initiates to smoking ritual and rules—may use and control its power, and they must use it in communal rituals. It is wasteful, disrespectful, and selfish not to share or to display smoke.

Could the intensity of the antismoking campaign have as much or more to do with controlling a powerful act as with preventing lung cancer or chronic bronchitis? One way to exert control over symbols is to transform them into sickness. Antismoking ideology labels smoking as an illness, and an illness of addiction, a sin of weakness. Indiscriminate selling and taking of smoke—sacred smoke, humankind's connection to the spiritual world—are profane. Cannabis became a policy problem when *smoking* "pot" emerged as a public activity. The cocaine "epidemic" followed the emergence of crack, *smokable* cocaine. Perhaps the abhorrence of women smoking cigarettes 100 years ago was as much a power struggle related to women's role in Western culture as it was a health issue. Children have never been allowed to smoke, except when applied by "smoke priests" for medical or ritual purposes, because they are not initiated or trained to be able to withstand and to control the powers set free in the smoke and by the act of making smoke. The recognition that tobacco smoking has serious, fatal health effects only confirms what has been known for time out of mind: smoke is potent, smoke can kill. The urge to smoke, the tantalizing sampling of forbidden power, remains unabated, perhaps even enhanced by demonstration of its social and biologic potency.

CONCLUSION

Olfaction, the sense of smell, has perplexed and pleased epistemologists since philosophy began (32). The cultural connections between fire and smoke and the sense of smell remain potent and pervasive. Smoke and scent are portents of sickness, sex, and spirit. Odors signal sexuality, pestilence, possession, and piety. Smells can still evoke panic.

The history and anthropology of smoking suggest that contemporary condemnation of tobacco, burned to make scent and smoke, has multiple origins. Cigarette smokers defy rituals and sanctity: addiction is no way to say prayers! Undisciplined, selfish smoking without ritual or communal meaning is dangerous. Addictive, uncontrolled cigarette smoking is pernicious because it is profligate and profane, as well as causing ill health. It is not surprising that social forces to control making smoke have become so powerful. On the other hand, elimination of the rites of making smoke impoverishes our sensual, symbolic, and sacred life. A world without odor would be a sterile world indeed. The rituals and rules that govern symbolic controlled combustion are ancient, perhaps a part of our biologic evolution.

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